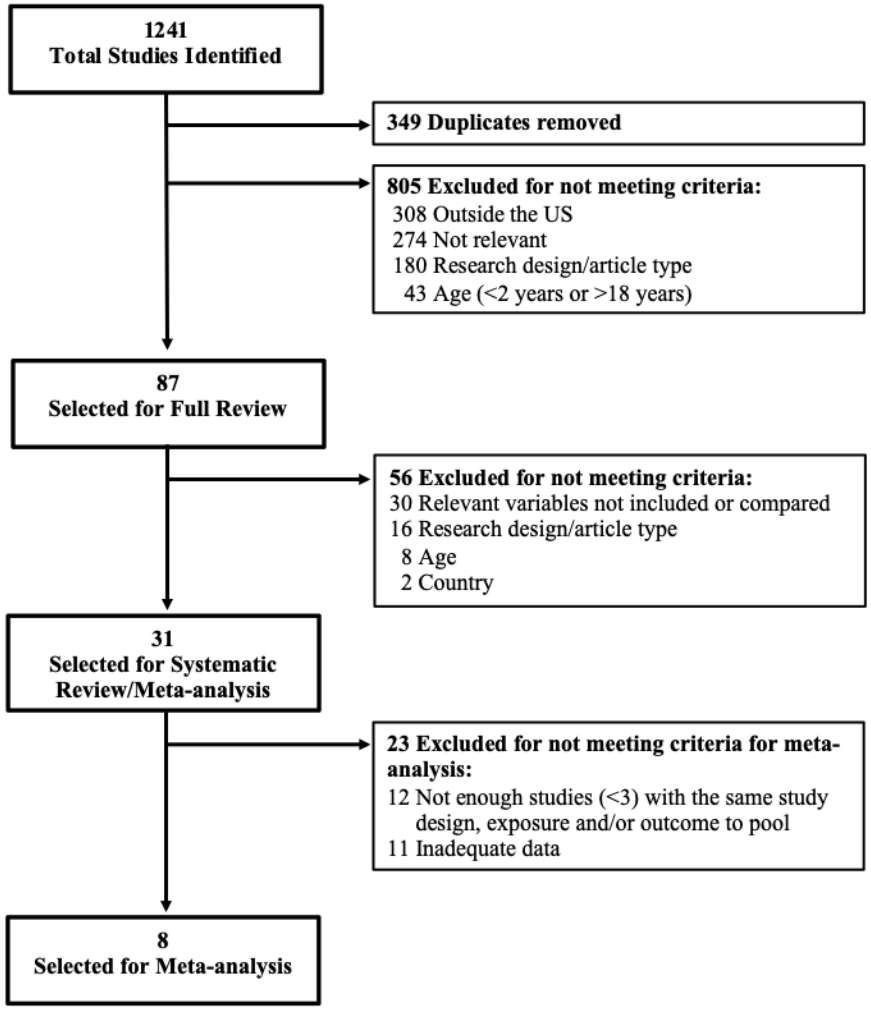


Figure 1a.

Figure 1a. Consort Diagrams for Family Meal Frequency and Dietary Outcomes

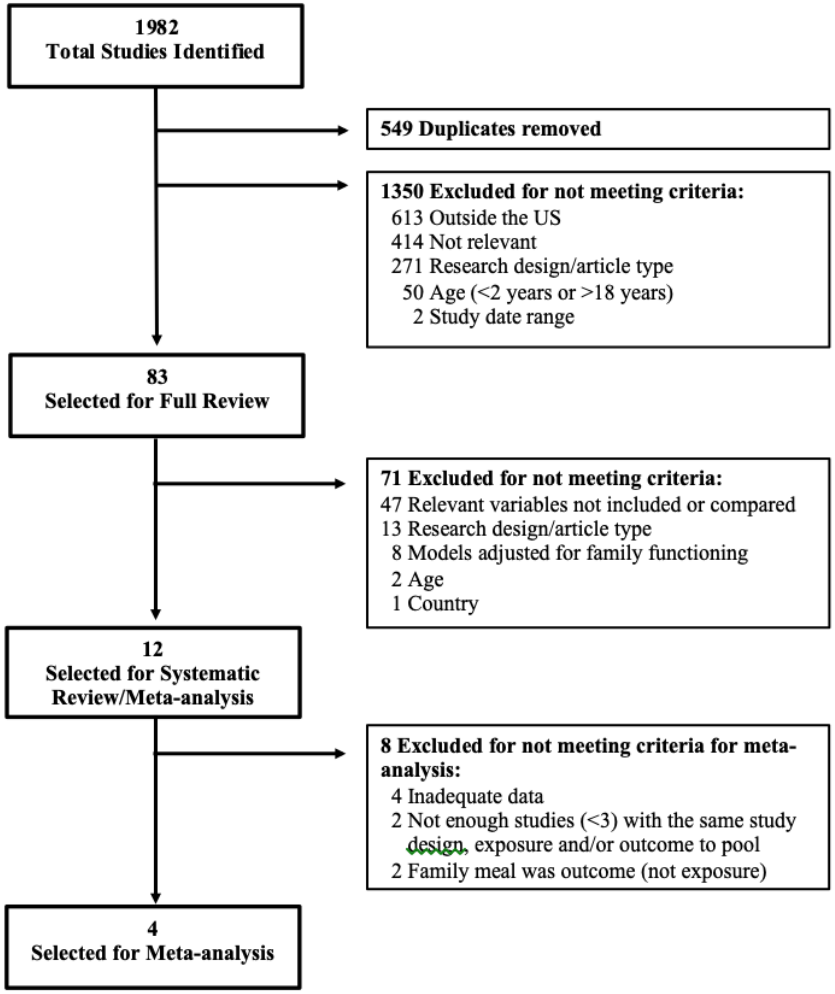
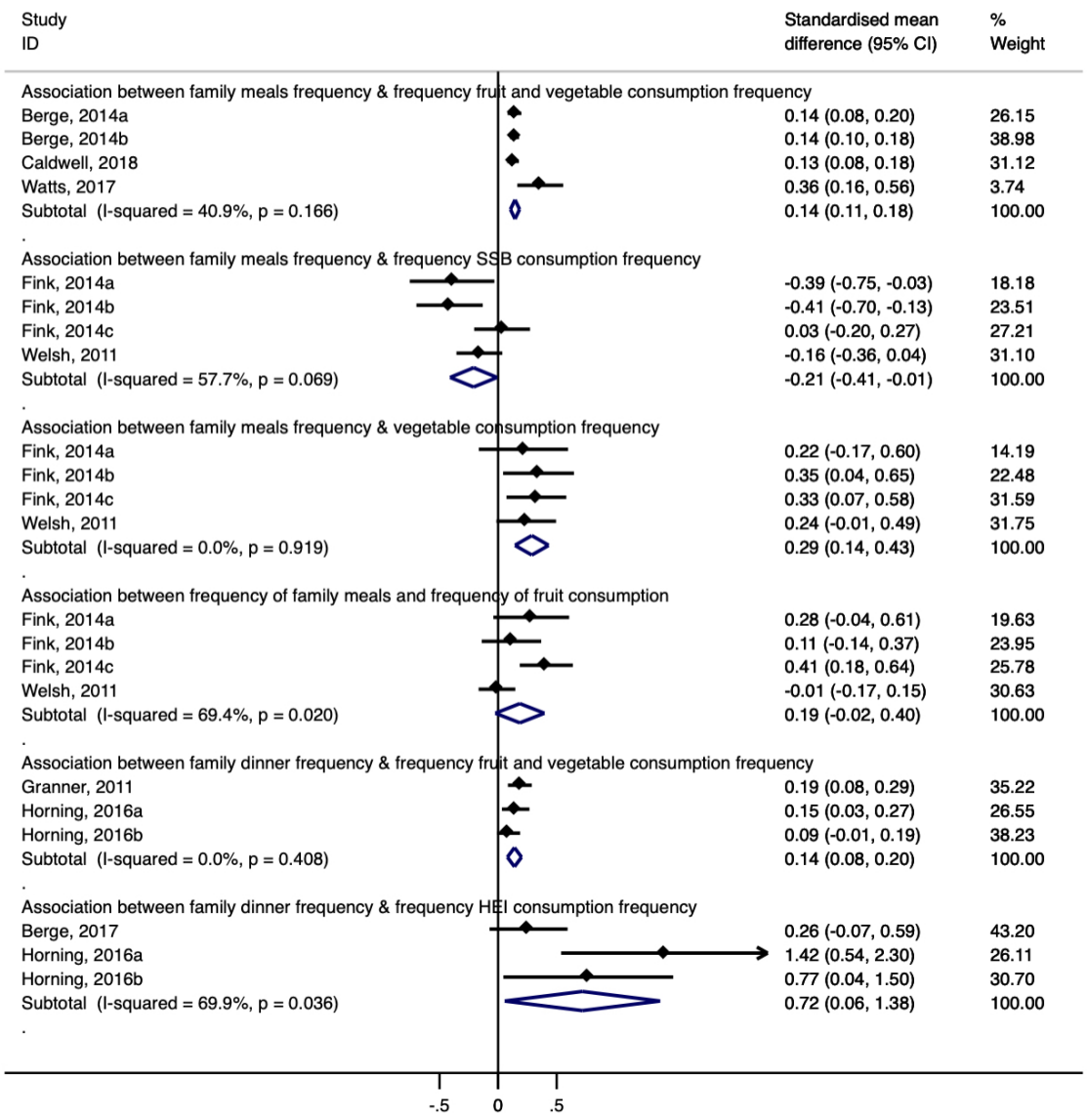
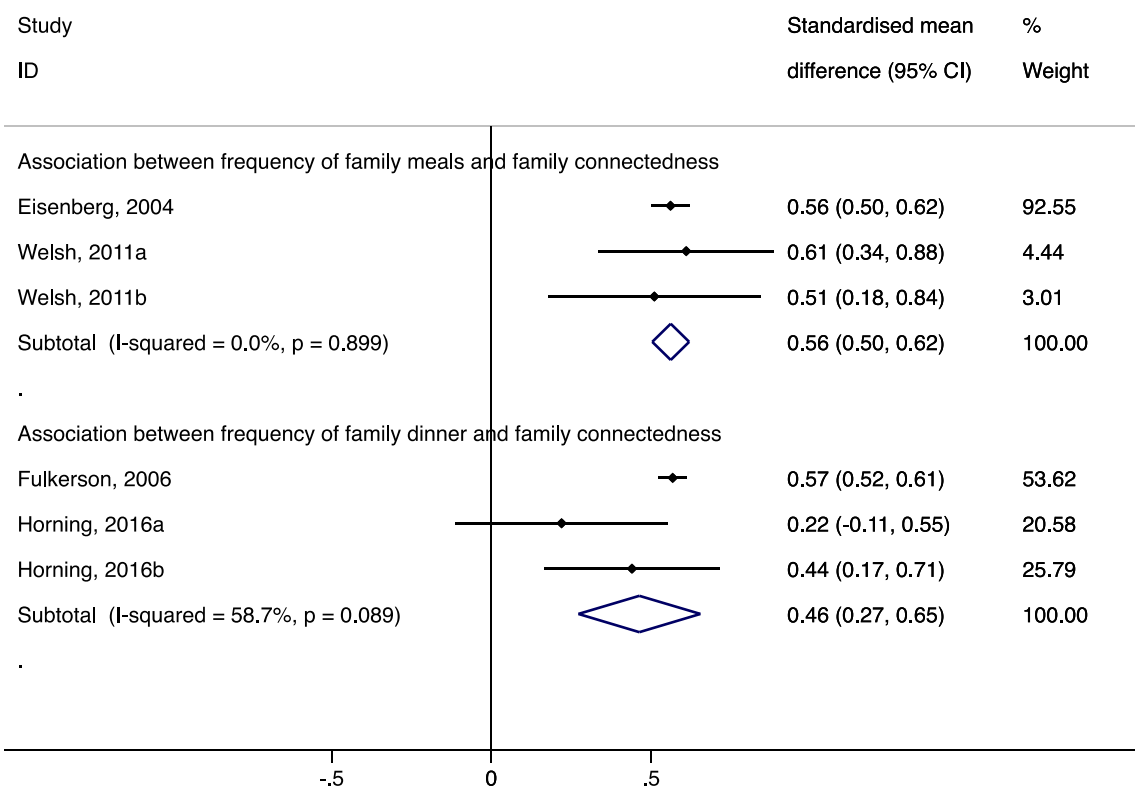


Figure 1b.

Figure 1b. Consort Diagrams for Family Meal Frequency and Family Functioning Outcomes


Study
ID
Standardised mean difference (95% CI)
%
Weight
Association between family meals frequency & frequency fruit and vegetable consumption frequency
Berge, 2014a 0.14 (0.08, 0.20) 26.15
Berge, 2014b 0.14 (0.10, 0.18) 38.98
Caldwell, 2018 0.13 (0.08, 0.18) 31.12
Watts, 2017 0.36 (0.16, 0.56) 3.74
Subtotal (I-squared = 40.9%, p = 0.166) 0.14 (0.11, 0.18) 100.00
Association between family meals frequency & frequency SSB consumption frequency
Fink, 2014a -0.39 (-0.75, -0.03) 18.18
Fink, 2014b -0.41 (-0.70, -0.13) 23.51
Fink, 2014c 0.03 (-0.20, 0.27) 27.21
Welsh, 2011 -0.16 (-0.36, 0.04) 31.10
Subtotal (I-squared = 57.7%, p = 0.069) -0.21 (-0.41, -0.01) 100.00
Association between family meals frequency & vegetable consumption frequency
Fink, 2014a 0.22 (-0.17, 0.60) 14.19
Fink, 2014b 0.35 (0.04, 0.65) 22.48
Fink, 2014c 0.33 (0.07, 0.58) 31.59
Welsh, 2011 0.24 (-0.01, 0.49) 31.75
Subtotal (I-squared = 0.0%, p = 0.919) 0.29 (0.14, 0.43) 100.00
Association between frequency of family meals and frequency of fruit consumption
Fink, 2014a 0.28 (-0.04, 0.61) 19.63
Fink, 2014b 0.11 (-0.14, 0.37) 23.95
Fink, 2014c 0.41 (0.18, 0.64) 25.78
Welsh, 2011 -0.01 (-0.17, 0.15) 30.63
Subtotal (I-squared = 69.4%, p = 0.020) 0.19 (-0.02, 0.40) 100.00
Association between family dinner frequency & frequency fruit and vegetable consumption frequency
Granner, 2011 0.19 (0.08, 0.29) 35.22
Horning, 2016a 0.15 (0.03, 0.27) 26.55
Horning, 2016b 0.09 (-0.01, 0.19) 38.23
Subtotal (I-squared = 0.0%, p = 0.408) 0.14 (0.08, 0.20) 100.00
Association between family dinner frequency & frequency HEI consumption frequency
Berge, 2017 0.26 (-0.07, 0.59) 43.20
Horning, 2016a 1.42 (0.54, 2.30) 26.11
Horning, 2016b 0.77 (0.04, 1.50) 30.70
Subtotal (I-squared = 69.9%, p = 0.036) 0.72 (0.06, 1.38) 100.00
-.5
0
.5


Study
ID
Standardised mean difference (95% CI)
%
Weight
Association between frequency of family meals and family connectedness
Eisenberg, 2004
0.56 (0.50, 0.62)
92.55
Welsh, 2011a
0.61 (0.34, 0.88)
4.44
Welsh, 2011b
0.51 (0.18, 0.84)
3.01
Subtotal (I-squared = 0.0%, p = 0.899)
0.56 (0.50, 0.62)
100.00
.
Association between frequency of family dinner and family connectedness
Fulkerson, 2006
0.57 (0.52, 0.61)
53.62
Horning, 2016a
0.22 (-0.11, 0.55)
20.58
Horning, 2016b
0.44 (0.17, 0.71)
25.79
Subtotal (I-squared = 58.7%, p = 0.089)
0.46 (0.27, 0.65)
100.00
.
-.5
0
.5

PubMed Search Strategy: Dietary Outcomes

((("family"[MeSH Terms] OR "family"[All Fields]) AND ("meals"[MeSH Terms] OR "meals"[All Fields])) OR (shared[All Fields] AND ("meals"[MeSH Terms] OR "meals"[All Fields])) OR (("family"[MeSH Terms] OR "family"[All Fields]) AND ("meals"[MeSH Terms] OR "meals"[All Fields] OR "mealtime"[All Fields]))) AND (("family"[MeSH Terms] OR "family"[All Fields]) AND (("diet"[MeSH Terms] OR "diet"[All Fields] OR "dietary"[All Fields]) AND intake[All Fields])) AND (("0001/01/01"[PDAT] : "2018/12/31"[PDAT]) AND English[lang] AND ("child, preschool"[MeSH Terms] OR "child"[MeSH Terms:noexp] OR "adolescent"[MeSH Terms]))

PubMed Search Strategy: Family Functioning Outcomes

((("family"[MeSH Terms] OR "family"[All Fields]) AND ("meals"[MeSH Terms] OR "meals"[All Fields])) OR (shared[All Fields] AND ("meals"[MeSH Terms] OR "meals"[All Fields])) OR (("family"[MeSH Terms] OR "family"[All Fields]) AND ("meals"[MeSH Terms] OR "meals"[All Fields] OR "mealtime"[All Fields]))) AND ((("family"[MeSH Terms] OR "family"[All Fields]) AND functioning[All Fields]) OR (("family"[MeSH Terms] OR "family"[All Fields]) AND cohesion[All Fields]) OR ("family relations"[MeSH Terms] OR ("family"[All Fields] AND "relations"[All Fields]) OR "family relations"[All Fields]) OR ("nuclear family"[MeSH Terms] OR ("nuclear"[All Fields] AND "family"[All Fields]) OR "nuclear family"[All Fields]) OR ("communication"[MeSH Terms] OR "communication"[All Fields]) OR interpersonal[All Fields]) AND (("0001/01/01"[PDAT] : "2018/12/31"[PDAT]) AND English[lang] AND ("child, preschool"[MeSH Terms] OR "child"[MeSH Terms:noexp] OR "adolescent"[MeSH Terms]))

Table 1. Characteristics of Studies with Dietary Outcomes Included in the Systematic Review and Meta-Analyses

Authors Year of Study; Location	**Primary Data Source**	**Study Design (follow-up)**	**Exposure Variable**	**Outcome Variable(s)**	**Sample Characteristics**	**Outcomes [Adjusted for]**
Andaya and colleagues[48] 2011; South Bay, San Diego, USA	Adventuras para Ninos	Cross-sectional	Frequency of breakfast family meals, lunch family meals dinner family meals	FVs	N = 794; 49.0% female; 6.4 (0.9) years	Family breakfast frequency (≥4 times per week vs. <4 times per week) was associated with FV intake (OR 0.64; 95%CI: 0.42, 0.98, p = .04). Family lunch frequency (≥4 times per week vs. <4 times per week) was not associated with FV intake (OR: 0.77; 95%CI: 0.49, 1.21, p = .26) and family dinner frequency (≥4 times per week vs. <4 times per week) was not associated with FV intake (OR:0.78; 95%CI: 0.43, 1.42, p =.41).
Appelhans and colleagues[41]	Home Environmen	Cross-sectional	Frequency of family	Fruits, vegetables,	n = 103; 52.4% female; 10.0 (2.5) years old; 76.7% Black/African	Family meal frequency was significantly correlated with fruit

2014; Chicago, USA	t Comparison Study		meals	soda, other SSBs, fast food	American; 17.5% Hispanic/Latino; 2.9% multi-ethnic/other; 1.9% Non-Hispanic White/Caucasian; 1.0% Asian	intake (r = 0.25, p < .05), vegetable intake (r = 0.032, p < .01), soda intake (r= -0.22, p <.05), and other sweetened beverage intake (r= -0.24, p<.05). Family meal frequency was not significantly associated with fast food intake (r = - 0.09).
Ayala and colleagues[43] 2007; San Diego County, USA	Secretos de la Buena Vida	Cross-sectional	Frequency of family meals	Sodas, snack foods	N = 167; 56% females; 12.8 (2.7) years	Family meal frequency was not significantly associated with snack foods consumed per day (β = -0.13) or sodas consumed per day (β = 0.01). [child age and mother's education, employment, and acculturation level]
Bauer and colleagues[36] 2011; Minnesota, USA	New Moves	Cross-sectional	Frequency of family meals	FVs, soft drinks	N = 253; 100% female; 15.7 years; 29.3% white, 25.7% African American/black, 10.7% Hispanic,	Family meal frequency was independently associated with FV intake (β = 0.41, p = .02), but not in

					24.1% Asian, 2.8% American Indian, 7.5% mixed/other	models adjusted for outcome-specific independent variables. Family meal frequency was not significantly associated with soft drinks in either model. [age, race/ethnicity, parent education, school as a random effect, outcome-specific independent variables]
Befort and colleagues[35] 2006; Kansas City, Missouri, USA	N/A	Cross-sectional	Frequency of family meals	Fruits, vegetables	N = 228; 66.2% female; 15 (1.77) years; 63.2% non-Hispanic black, 36.8% non-Hispanic white	Family meal frequency was significantly correlated with fruit intake ($r = 0.15$, $p \leq .05$), but not vegetable intake ($r = .08$, ns)
Berge and colleagues[46] 2014; Minneapolis/St. Paul Minnesota, USA	Project EAT (Eating and Activity in Teens) 2010	Cross-sectional	Frequency of family meals	FVs, fast food	N = 2,682; 53.5% female; 14.5 (2.0) years; 18.7% White, 29.2% African American/Black, 20.1% Asian American, 17.1% Hispanic, 3.4% Native American, 11.5% mixed or other	Family meal frequency was significantly associated with FV intake in girls ($\beta = 0.14$, $p < .001$) and boys ($\beta = 0.14$, $p < .001$), but was not associated with fast food consumption for girls or boys.

						[Age, sex, race/ethnicity]
Berge and colleagues[3] 2017; Minnesota and Tennessee, USA	NET-Works (Now Everybody Together for Amazing and Healthy Kids) and GROW (Growing Right Onto Wellness)	Cross-sectional	Frequency of breakfast family meals, lunch family meals, dinner family meals, total family meals	Diet quality	N = 276; 52.6% female; 3.5 (0.9) years; 26.4% White; 48.2% Black; 18.5% multi-racial; 6.9% other	Frequency of lunch family meals and dinner family meals was not associated with HEI-2010 in adjusted models. Frequency of breakfast family meals and total family meals was associated with HEI-2010 in non-Hispanic households (breakfast: $\beta = 0.1.30$, $p < .01$; total: $\beta = 0.38$, $p < .001$), but not Hispanic households. [Age, sex, marital status, employment status, study site, race/ethnicity (for non-Hispanic participants only); frequency of other two family meals]
Burgess-Champoux and colleagues[34]	Project EAT-I	Longitudinal (5-years)	Frequency of family	Fruits, vegetables,	N = 677; 55% female; T1: 12.8 (0.74) years, T2: 17.2 (0.59) years;	Regular family meals (≥5 meals per week) as compared to none were

2009; Minneapolis/St. Paul Minnesota, USA	(Eating Among Teens) and Project EAT-II		meals	soft drinks	36% white, 23% Asian, 41% African American/Hispanic/other	significantly associated with fruit intake (p = .008), vegetable intake (p = .03), but not soft drinks (p = .34) in males. Regular family meals (≥5 meals per week) as compared to none was only significant with vegetable intake (p = .004) in females. [race/ethnicity, SES, time 1 of outcome variable]
Caldwell and colleagues[56] 2018; USA	Early Childhood Longitudinal Study	Cross-sectional	Frequency of family dinner meals	FVs	N = 8,300; 49.2% female; 4 years 5 months; 43.5% non-Hispanic White; 15.1% non-Hispanic Black; 19.8% Hispanic; 21.5% Other	Dinner family meals (7 nights per week) was significantly associated with consuming more FVs (OR 1.3; 95%CI: 1.15, 1.39) as compared to those consuming 6 or less dinner family meals per week. [Parental education status, household income, mother's age,

						child ethnicity, child BMI, household total, parental employment status, child disability status]
Cutler and colleagues[33] 2011; Minnesota, USA	Project EAT-I (Eating Among Teens) and Project EAT-II	Longitudinal (5-years)	Frequency of family meals	Fruits, vegetables, FVs, snack foods, fast food	N = 2,516	At Time 1 family meal frequency was significantly associated with fruit intake (β = 0.05, p < .0001), vegetable intake (β = 0.05, p < .0001) and sweet and salty snack food intake (β = -0.03, p = .02). At Time 2 family meal frequency was significantly associated with FV intake (β = 0.06, p< .0001), fast food intake (β = -0.07, p < .0001), but not snack food intake (β = 0.01, ns). [SES, race/ethnicity, age, sex]
Demissie and colleagues[32]	NYPANS (The	Cross-sectional	Frequency of dinner	Fruits, vegetables,	N = 11,429; 49.4% female; 57.7% non-Hispanic White, 14.9% non-	Dinner family meals 5-7 days per week was significantly associated

2015; USA	National Youth Physical Activity and Nutrition Study)	(cluster sample design)	family meals	SSBs	Hispanic Black, 18.9% Hispanic, 8.5% other race/ethnicity	with consuming fruit (OR 1.38; 95%CI: 1.12, 1.70), vegetables (OR 1.57; 95%CI: 1.23, 2.00) and SSBs (OR 0.77; 95% CI: 0.63, 0.94) in females. Dinner family meals 5-7 days per week was significantly associated with fruit (OR 1.22; 1.02, 1.44), but not vegetables or SSBs in males. [race/ethnicity, grade]
Erinosho and colleagues[49] 2012; New York City, USA	N/A	Cross-sectional	Frequency of family meals	Fruits, vegetables, soft drinks, snack foods	N = 200; 3-5 years	Frequency of family meals (≤6 days per week vs. daily) had a lower odds of eating fruit ≥ 1 time per day (OR: 0.62, 95%CI: 0.32, 1.18;), vegetables ≥ 1 time per day (OR: 0.60, 95%CI: 0.30, 1.20), soft drinks ≥ 1 time per day (OR: 1.03, 95%CI: 0.55, 1.94) and snacks ≥3 times per week (OR: 0.84, 95%CI: 0.42, 1.68).

						[Parent ethnicity; parent highest level of education]
Feldman and colleagues[40] 2007; Minneapolis/St. Paul Minnesota, USA	Project EAT (Project Eating Among Teens)	Cross-sectional	Frequency of family meals	Fruits, vegetables, soft drinks, snack foods	N = 4,746; 49.8% female; 14.9 years; 48.5% White; 19.0% Black; 19.2% Asian American; 5.8% Hispanic; 3.5% Native American; 4.0% mixed/other	Frequency of family meals was significantly associated with vegetable intake ($p < .001$) and soft drink intake ($p < .001$), but not fruit intake ($p = .112$) or snack intake ($p = .122$) in adjusted models for boys. These relationships were all statistically significant in adjusted analyses for girls. [SES, school grade level, race/ethnicity, total weekly TV viewing in hours; total daily caloric intake]
Fink and colleagues[54] 2014; North Carolina, USA	North Carolina CHAMP	Cross-sectional	Frequency of main meal	Fruits, vegetables, SSBs	N = 1,992; 49.1%; 29.2% 0-5 years; 29.4% 6-11 years; 41.4% 12-17 years; 61.3% White non-Hispanic;	Main family meal frequency (5 or more family meals per week) was significantly associated with fewer

	(Child Health Assessment and Monitoring Program) survey				22.5% Black non-Hispanic; 9.98% Hispanic; 6.4% Other	daily servings of SSBs in children 0-5 years (OR: 2.04; 95%CI: 1.06, 3.93) and in children 6-11years (OR: 2.12; 95%CI: 1.27, 3.55); increased consumption of vegetables in children 6-11 years (OR: 1.87; 95%CI: 1.08, 3.24); and increased fruit and vegetable consumption in adolescents 12-17 years (fruit: OR: 2.11; 95%CI: 1.40, 3.19; vegetables: OR: 1.81; 95%CI: 1.14, 2.88). [Age, gender, race/ethnicity, hours of TV viewing per day, caregiver's education level]
Fulkerson and colleagues[42] 2009; Minneapolis/St. Paul Minnesota, USA	Team COOL (Controlling Overweight and Obesity	Cross-sectional	Frequency of dinner family meals	Fruits, vegetables, FVs, soda	N = 143; 49% females; 17.2 (1.2) years; 40% white; 31% black/African American; 29% other/Hispanic	Daily fruit intake was significantly ($p < .05$) higher for when family dinners occurred 5-7 days per week as compared to having 1-4

	for Life)					days per week or none. Family dinner frequency was not significantly related to daily vegetable intake, daily fruit and vegetable intake or soda intake. [race/ethnicity; age; gender; SES; school as a random effect]
Granner and Evans[53] 2011	N/A	Cross-sectional	Frequency of dinner family meals	FVs	N = 736; 54.7%; 17.2% 11 years; 35.5% 12 years; 34.8% 13 years; 12.5% 14-15 years; 48.9% black; 51.1% white	Dinner family meal frequency was significantly associated with FV intake when comparing <3 servings per day with 3-4 servings per day (OR: 1.4; 95%CI: 1.16, 1.68) and when comparing <3 servings per day with the >5 servings per day (OR: 1.61; 95%CI: 1.29, 2.0). [Race, age, sex, BMI]

Horning and colleagues[4] 2016; Minneapolis/St. Paul Minnesota, USA	HOME (Healthy Home Offerings via the Mealtime Environmental) Plus trial	Cross-sectional	Frequency of dinner family meals	FVs, SSBs, Diet quality	N = 160; 47% female; 10.3 (1.4) years; 68% white; 32% other; 9% Hispanic; 91% non-Hispanic	Dinner family meal frequency was significantly associated with higher HEI-2010 (parent reported family dinner frequency: β = 1.42 (0.45), p < .01; child- reported family dinner frequency: β = 0.77(0.37), p < .05) and parent-reported family dinner frequency with FV intake (β = 0.15(0.06), p < .05), but not child reported (β = 0.09(0.05), ns). Frequency of dinner family meals and SSBs was not significant for (parent reported family dinner frequency: β = -0.01(0.04), ns; child- reported family dinner frequency: β = -0.01(0.03), ns) [Education level of parent; child race]

Kornides and colleagues[46] 2014, USA	N/A	Cross-sectional	Frequency of family meals	Diet quality	N = 282; 48.8% female; 13.3 (2.9) years; 89% white; 2.8% black; 4.6% Hispanic; 3.5% other	Families with regular family meals (≥5 meals per week) had significantly higher HEI score (p = .047).
Koszewski and colleagues[37] 2011; Nebraska, USA	N/A	Cross-sectional	Frequency of breakfast family meals, lunch family meals, dinner family meals	Fruits, vegetables	N = 108; 6.74 (1.23) years	Family meal frequency (≥5-6 vs. ≤3-4) was significantly associated with fruit consumption for breakfast family meals (p = .01), and lunch family meals (p = .02). Family meal frequency at breakfast, lunch or dinner was not significantly associated with vegetable intake.
Larson and colleagues[31] 2007; Minnesota, USA	Project EAT (Eating Among Teens) - II	Longitudinal (5 years)	Frequency of family meals	Fruits, vegetables	N = 1,710; 555 female; 55.5% White; 16.2% African American; 17.4% Asian, 5.5% Hispanic/ 5.4% mixed/other race [these are weighted]	Family meal frequency was significantly associated with fruit intake in females (p = .049) and males (p = .004) and remained significant in males when additionally adjusted for Time 1

						inake. Family meal frequency was significantly associated with vegetable intake in females and males ($p < .05$) even after an additional adjustment of Time 1 intake. [Model 1: race; SES; age; total energy consumption; Model 2: race, SES, age, total energy consumption, Time 1 intake]
Larson and colleagues[26] 2013; Minneapolis/St. Paul Minnesota, USA	EAT 2010 (Eating and Activity in Teens)	Cross-sectional	Frequency of breakfast family meal	Fruits, vegetable, SSBs	N = 2,793; 53.2% female; 14.4 (2.0) years; 29.0% Black/African American; 18.9% White; 19.9% Asian American; 16.9% Hispanic; 3.7% Native American; 11.6% mixed or other	Frequency of breakfast family meals was significantly associated with fruit and vegetable intake. When adjusted for total energy intake frequency of breakfast family meals continued to be significantly associated with fruit and an inverse association with SSBs was significant.

						[Model 1: sex, school level, race/ethnicity, household structure, SES, family dinner frequency, family functioning and family cohesiveness; Model 2: All covariates in Model 1 + total energy intake]
Larson and colleagues[45] 2016; Minnesota, USA	Project BeakFAST (Fuelling Academics and Strengthening Teens)	Cross-sectional	Frequency of breakfast family meal	Diet quality	N = 827; 55.1% female; 9-10th grade; 28.3% Non-white; 67.1% White; 12.9% Hispanic; 81.3% Non-Hispanic	Total HEI score was not significantly different for males (p = .44) or females (p = .99) by family breakfast frequency. [School grade level, race, ethnicity, household structure, free/reduced priced school meal eligibility, household food security, random effect for school]
Larson and colleagues[50]	EAT 2010 (Eating and	Cross-sectional	Frequency of family	Snack foods	N = 2,540; 54% female; 14.5 (2.0) years; 19.7% White; 27.9% African	Family meals were significantly associated with snack intake for

2017; Minnesota, USA	Activity in Teens)		meals		American or Black; 20.5% Asian American; 17.2% Hispanic; 3.6% Native American; 11.1% mixed or other	males and females combined (β = 0.10 (0.05); p = .037), but was not significant when stratified by sex: males (β = 0.11 (0.07); p = .15), females (β = 0.10 (0.06); p = .097). [Gender, age, SES, ethnicity/race, random school-level effect (mutually adjusted for all individual and environmental characteristics)]
Lipsky and colleagues[44] 2015; USA	NEXT Generation Health Study	Longitudinal (4 years)	Frequency of Family Meals	FVs, SSBs snack foods	N = 2,785; 54.52% female; 16.27 (0.03) years; 55.7% non-Hispanic white; 20.29% non-Hispanic black; 19.29% Hispanic; 4.82% other	Family meals were significantly associated with FV intake (β = 0.33 (0.05); p < .001), but not with soda (p = .89) or snack intake (p = .80). [wave; time-varying BMI, height and vigorous physical activity, and baseline sex, race/ethnicity, family affluence score, parent education,

						urbanicity]
Neumark-Sztainer and colleagues[29] 2003, St. Paul/Minneapolis, Minnesota, USA	Project EAT (Eating Among Teens)	Cross-sectional	Frequency of family meals	Fruits, vegetables, FVs, snack foods	n = 4,746; 49.8% female; 14.9 (1.7) years; 48.5% White; 19.0% Black; 19.2% Asian American; 5.8% Hispanic; 3.5% Native American; 3.9% mixed/other	Family meal frequency was significantly associated with fruit, vegetable, and FV intake ($p < .001$). Family meal frequency was not significantly associated with snack food intake ($p = .24$) [gender, school level, race, mother's employment status, SES]
Ranjit and colleagues[47] 2015; Texas, USA	2009-2011 Texas SPAN (School Physical Activity and Nutrition) Surveillance Study	Cross-sectional	Regular family meals	Diet quality	n = 3,131; 53% female; 9.6 years; 357 (12%) Black, 1490 (50%) Hispanic, 1154 (38%) White/other	Regular family meals (3 or more per week) was not significantly associated with SPAN HEI score ($\beta = 0.13$; 95% CI: -0.82, 1.07, $p = .79$). [education, race/ethnicity, rural/urban location, neighborhood environment]
Ranjit and	CATCH	Cross-	Number of	FVs, SSBs,	n = 2,502; 51.8% female; 13.9	Number of family meals in the past

colleagues[28] 2015; Austin, Texas, USA	(Coordinated Approach to Child Health) Middle School Program	sectional	family meals	salty snacks, desserts	(0.59) years; 365 (14.6%) Black, 1,440 (57.6%) Hispanic, 697 (27.9%) White	week was significantly ($p < .05$) correlated with FVs ($r = 0.18$), SSBs ($r = -0.05$), but not salty snacks or desserts.
Surjadi and colleagues[39] 2017; USA	Early Childhood Longitudinal Study	Longitudinal	Frequency of breakfast family meals, dinner family meals	FVs	n = 6,503; K-8th grade; 70% Non-Hispanic White; 16.6% Hispanic; 8.8% non-Hispanic Black; 4.6% Asian	Family mealtimes significantly predicted FV consumption in Non-Hispanic White ($\beta = 0.14$ (0.05), $p < .01$), Non-Hispanic Black ($\beta = 0.43$ (0.20), $p < .05$), Hispanic ($\beta = 0.20$ (0.11), $p < .10$) children, but this relationship was not significant for Asian children.
Videon and Manning[38] 2003; USA	National Longitudinal Study of Adolescent Health	Cross-sectional	Frequency of dinner family meal	Fruits, vegetables	n = 18,177; 49% female; 15.9 years; 65.9% white, 16.1% black, 12.1% Hispanic, 3.9% Asian, 2.0% native American	Adolescents who ate 6 or 7 family meals per week were significantly less likely than adolescents who ate 3 or fewer family meals to report eating less than 2 servings

						of fruits (OR: 0.69; 0.61-0.77, p < .001) and vegetables (OR: 0.62; 0.55-0.69, p < .001) per day. Adolescents who ate 4 or 5 family meals per week were significantly less likely than adolescents who ate 3 or fewer family meals to report eating less than 2 servings of fruits (OR: 0.78; 0.69-0.88, p < .001) and vegetables (OR: 0.81; 0.70-0.93, p < .01) per day.
Watts and colleagues[52] 2017; Minneapolis/St. Paul Minnesota, USA	Project EAT (Eating and Activity in Teens) 2010	Cross-sectional	Frequency of family meals	FVs	N = 2,491; 53.9% female; 14.5 (2.0) years; 27.8% African American/Black, 19.5% White, 20.8% Asian, 17.2% Hispanic, 3.6% Native American, 11.1% Mixed or other	Having 5 or more family meals per week was significantly associated with FV intake (β = 0.36, p = .001). [Age, sex, SES, race/ethnicity, energy intake (kcals/day), each independent variable in the model]

Welsh and colleagues[51] 2011; Minneapolis/St. Paul Minnesota, USA	N/A	Cross-sectional	Frequency of family meals	Fruits, vegetables, SSBs, snack foods	N = 75; 12 -17 years	Family meals were significantly positively associated with vegetable intake (β = 0.24, p < .10) and significantly negatively associated with SSBs (β = -0.16, p < .05). [Age, gender]

Table 2. Characteristics of Studies with Family Functioning Outcomes Included in the Systematic Review and Meta-Analyses

Authors Year of Study; Location	**Primary Data Source**	**Study Design**	**Exposure Variable**	**Outcome Variable(s)**	**Sample Characteristics**	**Outcomes [Adjusted for]**
Berge and colleagues[61] 2013; Minneapolis/St. Paul Minnesota, USA	Project EAT (Eating and Activity in Teens) 2010	Cross-sectional	Family Meal Frequency	Family Functioning	N = 2,793; 53.2% female; 14.4 (2.0) years; 21.2% white; 29.0% black; 16.5% Hispanic; 19.9% Asian; 3.7% native American; 9.7% mixed/other	Higher family functioning was associated with more frequency family meals in girls (β = 0.31 (0.02), p < .001) and boys (β = 0.25 (0.03), p < .001) [race/ethnicity, SES, age]
Eisenberg and colleagues[64] 2004; Minneapolis/St. Paul Minnesota, USA	Project EAT (Eating Among Teens)	Cross-sectional	Family meal frequency	Family connectedness	N = 4,734; 49.8% female; 34.3% middle school, 65.7% high school; 48.5% White; 19.0% African American; 5.8% Hispanic; 19.2% Asian American; 3.5% Native	Family connectedness was significantly correlated with family meal frequency (r = 0.27, p < .001).

					American; 4.0% Mixed/other	
Franko and colleagues[60] 2008; University of California at Berkeley, University of Cincinnati/ Cincinnati Children's Hospital Medical Center, and Westat, Inc./ Group Health in Rockville, Maryland, USA	National Heart, Lung, and Blood Institute Growth and Health Study	Longitudinal (10 years)	Family Meal Frequency	Mediator: Family Cohesion	N = 2,379; 100% female; 9.5 years; 51% white; 49% black	More frequent family meals was predictive of family cohesion ($X^2(1) = 101.02$, $p < .001$) [site, race, parental education, one vs. Two parental household]
Fulkerson and colleagues[65] 2006; USA		Cross-sectional	Dinner family meals	Positive family communication	N = 99,426; 50.2% female; 60% 9th-12th grade and 40% 6th-8th grade; 86% Caucasian; 5% multiracial; 4% Latino; 2%	Having 5-7 family dinner meals per week was significantly associated with positive family

					Asian-Pacific Islander; <2% African American; <2% American Indian	communication (OR 2.8; 95%CI: 2.58, 3.04) when compared to 0-1 family dinner meals per week. [Gender, ethnicity, grade, maternal education, family structure]
Fulkerson and colleagues[58] 2010; Chicago Public Schools, USA	Project Northland Chicago (PNC)	Longitudinal (3.5 years)	Dinner Family Meals	Parent-Child Communication	N = 4,750; "split by gender"; 51% African American; 34% Latino; 15% Caucasian	Family dinner frequency was associated with an increase in parent-child communication.
Horning and colleagues[4] 2016; Minneapolis/St. Paul Minnesota, USA	Healthy HOME (Home Offerings via the Mealtime Environment) Plus Trial	Cross-sectional	Dinner family meals	Family connectedness	N = 160; 47.0% female; 10.3 (1.4) years; 68% white; 32% other; 9% Hispanic; 91% non-Hispanic	Dinner family meal frequency was significantly associated family connectedness ($\beta = 0.33$, $p < .05$). [Child race, parent

						education level]
Lawrence and colleagues[62] 2017; South-eastern USA	N/A	Cross-sectional	Dinner Family Meals	Communication	N = 50; 54% female; 14.61 years; 53% African American; 42% Caucasian, 5% other	Family dinner frequency was correlated with family communication score (r = 0.25, p < .05).
Loth and colleagues[57] 2015; Minneapolis/St. Paul, Minnesota, USA	Project EAT (Eating and Activity in Teens) 2010	Cross-sectional	Family Meal Frequency	Family Functioning	N = 2,793; 53.3% female; 14.45 (1.98) years; 18.8% White, 28.9% African American; 16.9% Hispanic; 19.9% Asian American, 3.7% Native American; 11.9% Mixed race/other/missing	Significant effect modification by family functioning among girls (for the association between family meals and unhealthy weight control behaviors). [age, race, SES, BMI]
Martin-Biggers and colleagues[66] 2018; USA	Home Obesogenic Measure of EnvironmentS (HOMES)	Cross-sectional	Family Meal Frequency	Family cohesion; family conflict	N = 550; 100% female; 32.26 (5.82) years; 72% white	Families with high family cohesion (β = 0.87 (0.50), p < .10), and low household chaos (β = 1.15 (0.55), p

	survey					< .05) ate significantly more family meals together each week compared to families with low family cohesion and high household chaos. [mother's education level, paid hours of employment/week, race/ethnicity, general health status, weight status, family affluence, household composition (single vs. dual parents, number of children <18 years in household), total number family

						meals/week, family meal atmosphere, food insecurity risk, and child's sex, age, weight status, and general health status]
Musick and colleagues[59] 2012; USA	National Longitudinal Survey of Adolescent Health	Longitudinal (1994-1995 (wave 1); 1996 (wave 2); 2001-2002 (wave 3)	Dinner Meal Frequency	Parent-Child Relationship Quality	N = 18,536; 7-12th grade	More frequenct dinner meals was significantly associated with better parent-child relationship quality.
Watts and colleagues[52] 2017; Minneapolis/St. Paul, Minnesota, USA	Project EAT (Eating and Activity in Teens) 2010	Cross-sectional	Family meal frequency	Parent communication	N = 2,793; 53.9% female; 14.5 (2.0) years; 27.8% African American or black, 19.5% white, 20.8% Asian American, 17.2% Hispanic, 3.6% Native American, 11.1% mixed or	The proportion of high parent communication was significantly different between frequent (≥5 times per week) and infrequent

					other	(≤2 times per week) family meals.
Welsh and colleagues[51] 2011; Minneapolis/St. Paul Minnesota, USA		Cross-sectional	Family meal frequency	Family cohesion	N = 75; 12-17 years	Family meal frequency was significantly correlated with family cohesion score ($r = 0.41$, $p < .01$).